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A Conditional Process Analysis on the Relationship between the Use of Social Networking Sites, Attitudes, Peer Norms and Adolescents' Intentions to Consume Alcohol

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Abstract

Visiting social networking sites has become an important part of adolescents' leisure activities. The current cross-sectional survey ($n = 674$) of adolescents aged 13-16 years aimed to examine a conditional process model on the relationships between adolescents' use of social networking sites and their descriptive /injunctive peer norms, attitudes, and intentions regarding alcohol use. First, the results support that exposure to alcohol-related content on social networking sites predicts respondents' descriptive and injunctive norms on alcohol use. Adolescents who are more frequently exposed to alcohol-related content believe that a higher number of their friends consume alcohol and that this use is socially acceptable. These descriptive and injunctive norms were positively associated with adolescents' drinking intentions. Second, the results support that the relationship between injunctive norms and intentions is stronger for respondents being more frequently exposed to alcohol-related messages on Facebook. Overall, the results shed more light on the complex associations between social networking sites, alcohol use, and the role of peers in this relationship.

Keywords: adolescents, alcohol, attitudes, social networking sites, social norms

A Conditional Process Analysis on the Relationship between the Use of Social Networking Sites, Attitudes, Peer Norms and Adolescents' Intentions to Consume Alcohol

Introduction

With up to 90% of adolescents using social networking sites (SNS) (e.g., Facebook) on a regular basis (ACMA, 2009), the usage of social media has become an important leisure activity during adolescence. It is in the same phase of life that adolescents also increasingly become confronted with substance use. One of the most popular choices of substance use is alcohol use. Scholars have drawn attention to adolescents' alcohol drinking as (late) adolescents have been increasingly found to consider heavy episodic drinking as a natural part of being a "teenager" (Hibell et al., 2007; Peretti-Watel, Beck, & Legleye, 2006). As alcohol use during adolescence has been related to a multitude of negative health risks in later adulthood, such as the use of illicit drugs, delinquency (Barnes, Welte, & Hoffman, 2002; D'Amico, Edelen, Miles, & Morral, 2008; Huang, Lanza, Murphy, & Hser, 2012), poor academic performance (Busch et al., 2014), and later substance abuse and dependence (Magid & Moreland, 2014), scholars have highlighted the importance of understanding why adolescents start to consume alcohol (e.g., Tucker, Miles, & D'Amico, 2013).

Recently, media research has suggested that the two popular leisure activities of visiting SNS and using alcohol in adolescence may be related. Images of peers consuming alcohol or updates on drinking and partying are likely to be encountered when visiting SNS (Beullens & Schepers, 2013; Egan & Moreno, 2011), suggesting SNS may play a role in adolescents' intentions to use alcohol.

The current cross-sectional study ($n = 674$; $M_{age} = 14.83$) aims to investigate how exposure to alcohol-related content on Facebook relates to early and middle adolescents' developing intentions to consume alcohol. In this exploratory study, we sought to build on and extend adolescent research on social networking use and risk behavior in, at least, three

ways. A first contribution of the study is that, perspectives from behavioral theories (i.e., theory of reasoned action) with literature on media processes (i.e., reinforcing spirals model) are combined to understand the role of SNS in intentions to consume alcohol. More precisely, a specific type of moderated mediation is examined based on an integration of different insights from this literature. In this hypothesized conditional process model, Facebook is associated with adolescents' intentions to consume alcohol via a mediated and an interactive path. In both paths, social norms and attitudes regarding alcohol use play an important role.

A second contribution relates to the study focus on early and middle adolescents (13 - 16 years). Prior research on SNS and alcohol use has so far specifically been conducted in college students (e.g., Cook et al., 2013; Huang et al., 2014; Moreno et al., 2012a; Ridout et al., 2012), while literature warrants attention for the developmental group of adolescents (Tucker et al., 2013).

A third contribution is the attention to the role of peers in media effects. It has been argued that peer influences peak in adolescence. Steinberg and Monahan (2007) indicated that adolescents actually influence each other and that these effects are stronger in adolescence compared to children or adults. By studying relationships between media content produced by one's peers (i.e., alcohol depictions on social networking profiles of peers) and peer norms about alcohol use (based on theory of reasoned action), this study intends to further enhance our understanding of how peers and media affect adolescent development.

Facebook Use, Alcohol Depictions, and Alcohol Use

Depending on the sample under examination, it has been reported that between 56% (Egan & Moreno, 2011) and 95% (Beullens & Schepers, 2013) of the social networking profiles contain references to alcohol use (Moreno et al., 2010). On average, Facebook profiles display 17 pictures that show alcohol use in an implicit or explicit way (Beullens & Schepers, 2013). Text references to alcohol use appear to be less common compared to

pictures. Yet, in one sample about 40% of the profiles contained at least one status update referring to alcohol use. In the majority of the cases, these social network profiles referred to alcohol use in a positive context (Beullens & Schepers, 2013). In line with what has been argued by Chou and Edge (2012), the abundance of alcohol-related pictures and postings on SNS might be explained by individuals' tendency to share pictures and status updates on positive life events and happy moments. In real life, these moments are often celebrated with alcohol. Moreover, such celebration is likely to occur when going out as one study also noted that 73.94% of the pictures containing alcohol use were taken during the evening or night (Beullens & Schepers, 2013). Based on these content analyses, researchers have expressed their concerns on the effects exposure to alcohol-related content on SNS (i.e., references to alcohol use and going out) might have (e.g., Beullens & Schepers, 2013).

A scarce number of empirical studies have suggested a relationship between SNS and alcohol-related outcomes. Moreno, Christakis, Egan, Brockman, and Becker (2012) indicated that college students who publicly display references to intoxication or problem drinking were more likely to be at risk for real-life problem drinking compared to students not displaying alcohol use on their SNS. Similarly, Ridout, Campbell, and Ellis (2012) reported that university students who presented alcohol as a component of their identity on SNS were more likely to meet the criteria for having alcohol-related problems. Among adolescents, Tucker et al. (2013) examined the association between exposure to alcohol-related content in the media (including but not limited to SNS) and alcohol use. Similar to the results reported for college students, their data indicated that a greater exposure to media containing references to alcohol and other drug use was associated with a higher probability of alcohol use one year later (Tucker et al., 2013).

These studies thus provide evidence for a relationship between exposure to SNS and alcohol-related outcomes. However, they have only to a limited extent focused on adolescents

and explored *why* these factors are interrelated. The only study among adolescents therefore called for more research to understand the mechanisms that drive associations between exposure to media, such as SNS, and alcohol behavior in adolescents (Tucker et al., 2013).

Toward a Moderated Mediation Model to Examine the Relationship between Facebook Use and Adolescents' Intentions to Use Alcohol

Already in 1960, Klapper proposed that media effects “function among and through a nexus of mediating factors and influences” (p. 8) and that a number of factors might reinforce these media effects. More recently, Tucker et al. (2013) together with several media effects scholars (Lang & Ewoldsen, 2010; Slater, 2007) have also underlined the need to systematically study the different roles that media and non-media variables may have in media effect processes. In a response to this call, Valkenburg and Peter (2013b) recently organized the existing media effects literature into one overarching model, the differential susceptibility to media effects model (DSMM) (Valkenburg & Peter, 2013b). Building upon well-cited theories including the social cognitive theory, the reinforcing spirals model (RSM) and theory of reasoned action (TRA), the DSMM structures and organizes the propositions of these theories and gives an overview of *how* media exposure may affect adolescents and *why* particular adolescents may be more susceptible to the influence of media exposure. More precisely, the DSMM explains theoretical literature has conceptualized particular non-media variables as both mediators and moderators, and highlights the importance of empirically testing the different roles of these variables to understand how media effects operate (Valkenburg & Peter, 2013b, p.231). Following this call to systematically examine the different conceptual roles of variables operating in media processes, the present study tests two potential paths through which exposure to alcohol use on Facebook and adolescents' drinking intentions might be related.

The mediation path between Facebook use and intentions. According to the DSMM, literature on media effects shows that certain media effects also serve as mediators. The DSMM proposes that prior communication theory predicts that media use may result in particular outcomes, which in turn may affect other constructs. Together these constructs describe the processes through which media effects occur (Valkenburg & Peter, 2013b). The authors (Valkenburg & Peter, 2013b) argue that these mediating media effects last beyond the media use itself.

A review of the literature on (adolescent) behavior suggests three cognitive factors may function as mediating media effects and may as such be important for understanding the relationship between exposure to alcohol depictions on social networking profiles and adolescents' intentions to use alcohol: attitudes, subjective norms, and descriptive norms.

Within TRA (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), attitudes are defined as the degree to which an individual values a particular behavior. Subjective norms are the degree to which an individual perceives social pressure to engage in a particular behavior or not. As argued by Rhodes, Ewoldsen, Shen, Monahan, and Eno (2014), subjective norms are a good example of the so-called injunctive norms defined as "socially transmitted codes of behavior that carry with them implied social rewards and punishments" (p. 4). These injunctive norms differ from descriptive norms which are considered to be an individual's perception of the degree to which a certain behavior is displayed by others or as Borsari and Carey (2008, p. 333) stated "the observation of others' overt behaviors". Thus, applied to alcohol consumption, descriptive norms are an individual's perceptions of how frequently others consume alcohol, while injunctive norms are the degree to which an individual thinks others approve of the consumption of alcohol.

TRA emphasized the importance of attitudes and social norms in why people intend to engage in behavior. TRA, and literature building on TRA (Ajzen & Fishbein, 1980; Fishbein

& Ajzen, 1975; Fishbein & Yzer, 2003), expects that socialization sources, such as media, shape attitudes and norms, which, in turn, predict and explain one's behavioral intentions and subsequent behavior. In this process, media function as a predictor, while attitudes and norms serve as multiple mediators for relationships between media use on the one hand and behavioral intentions and subsequent behavior on the other hand.

A number of studies has provided empirical support on the theory's multiple mediator model predicting that (1) media, such as SNS, may predict attitudes and norms about alcohol use, and that (2) these attitudes and norms, subsequently, predict alcohol-related outcomes. Regarding the first assumption, Litt and Stock (2011) conducted an experiment in which they manipulated participants' exposure to Facebook profiles with or without references to alcohol use. Their results indicated that participants who were exposed to alcohol use on Facebook, perceived alcohol use to be more normative, evaluated alcohol users as more positive, and had more positive attitudes toward alcohol use. Moreover, this study also provided support for the second assumption of literature on TRA as both attitudes and norms were found to predict participants' willingness to consume alcohol. In line with the latter study, a number of other studies have shown that both descriptive and injunctive norms are related with alcohol use (Elek, Miller-Day, & Hecht, 2006). Larimer, Turner, Mallett, and Markman Geisner (2004) reported that alcohol consumption, alcohol-related problems, and alcohol dependency symptoms are predicted by students' descriptive and injunctive norms with regard to alcohol use. Likewise Dieterich, Stanley, Swaim, and Beauvais (2013) reported that adolescents' descriptive norms were associated with the likelihood of having been drunk in the past month, binge drinking and overall alcohol use. Lac, Crano, Berger, and Alvaro (2013) also found descriptive and injunctive norms on the one hand and alcohol attitudes on the other hand to be related to emerging adults' intention to consume alcohol.

In line with these findings and following the DSMM and the TRA, the present study examines adolescents' attitudes toward alcohol use, with descriptive norms and injunctive norms as mediators of the relationship between exposure to alcohol use on Facebook and adolescents' intention to drink alcohol in the future. Exposure to alcohol use on Facebook is thus considered the main predictor in this model that triggers a process of attitudes, norms, and intentions regarding alcohol use. The following hypothesis is proposed:

H1: The positive path between exposure to alcohol-related content on Facebook and behavioral intentions to use alcohol in the future is mediated by adolescents' attitudes and social norms on alcohol use

The moderation path between Facebook use and intentions. Apart from explaining how media effects may function as mediators, the DSMM (Valkenburg & Peter, 2013b, p. 234) stresses that prior literature has learned us that “media effects might be amplified if messages converge with the opinions, values and norms in the social environment of the media user”. If we apply this proposition on the relationships among exposure to alcohol use on Facebook, attitudes and social norms about alcohol use, and adolescents' intentions to use alcohol, we may propose that the interactions between media use and social norms on the one hand and attitudes on the other hand might also significantly predict adolescents' intentions to consume alcohol. More precisely, the literature has suggested that social norms and attitudes regarding alcohol use start developing in childhood and are further shaped by one's social environment throughout the lifespan (Borsari & Carey, 2001; Hahn et al., 2000). As argued above, we expect SNS to affect these attitudes and norms during adolescence, but research (Borsari & Carey, 2001; Rosenquist, Murabito, Fowler, & Christakis, 2010) has also shown that they are already shaped in advance by other factors (e.g., social environment). Potentially, these pre-existing attitudes and norms interact with exposure to alcohol-related content on SNS. As such, exposure to positive alcohol portrayals on SNS may strengthen the

relationship between attitudes, social norms, and intentions. For instance, an adolescent whose friends frequently consume alcohol is likely to have endorsed more positive attitudes toward alcohol, and descriptive and injunctive social norms that are favorable toward alcohol use (Huchting, Lac, & LaBrie, 2008). Moreover, this adolescent may also more frequently encounter depictions of alcohol use on his or her Facebook profile. Exposure to alcohol use on Facebook and adolescents' attitudes and social norms about alcohol use may thus simultaneously (regardless of processes going on between these two factors) exert a more intense influence on adolescents' intentions to use alcohol.

Following this line of reasoning, a second process of how SNS relates to adolescents' intentions to consume alcohol can be hypothesized. More precisely, the influence of adolescents' attitudes, descriptive and injunctive social norms about alcohol use on behavioral intentions to consume alcohol in the future may be moderated by exposure to alcohol use on Facebook. Therefore, the following hypothesis will be tested:

H2: Exposure to alcohol-related content on Facebook moderates the relationship between attitudes, descriptive and injunctive norms, and adolescents' intentions to drink alcohol in the future.

Current Study

Figure 1 presents the hypotheses that will test two different processes on how Facebook use may relate to adolescents' developing intentions to use alcohol: (a) a mediated path in which exposure to alcohol-related content on Facebook predicts the intention to use alcohol through attitudes, descriptive and injunctive norms on alcohol use, and (b) a moderated path in which the relationships between attitudes, descriptive and injunctive norms on alcohol use on the one hand and intentions on the other hand are moderated by exposure to alcohol-related content on Facebook. These two processes will be tested by estimating one moderated mediation model which addresses both hypotheses simultaneously (Hayes, 2013,

2015; Preacher, Rucker, & Hayes, 2007). Constructs which have been shown to be related to media use and risk-taking, namely sensation seeking and gender, will be considered as control variables in this model (Beyens & Eggermont, 2014; Peter & Valkenburg, 2008; Zuckerman, 1994).

[FIGURE 1: ABOUT HERE]

Method

Sample

Data were collected among a convenience sample of 689 adolescents. A large school was selected in Flanders (Belgium), and permission to distribute the questionnaires among the adolescents was obtained from the legal guardians of the children. All ethical requirements were followed according to the appropriate procedures that apply in Belgium. All adolescents ($N = 880$) from the 3th and 4th year of this high school received the questionnaire. They were asked to participate in a study on media use and leisure activities. If adolescents agreed to participate, they were asked to complete the paper-and-pencil questionnaire during school time when one of their teachers was absent. During data collection, supervision was provided, and the confidentiality of the data was assured. After filling in the survey, each respondent stored his or her survey in a sealed box that was picked up by a researcher. No identifying data were asked to ensure anonymity.

In total, 689 respondents completed the questionnaire. This implies that, 78.30% of the adolescents of this school agreed to participate in this study. Thirty-eight percent of the respondents were boys, 1 respondent was 13 years old, 33.1% were 14, 47.4% were 15, 17.2% were 16, 2% were 17, and 1 respondent was 18 years old. Seventeen and 18 years olds were deleted from the sample so that it only contained early and middle adolescents. Thus, the total sample on which the analyses of the current study were conducted consists of 674 adolescents with a mean age of 14.83 ($SD = .70$). Sixty-two percent were girls, 73.95% of the

mothers of the respondents and 68.29% of the fathers of the respondents obtained a degree in higher education.

Measures

Attitudes toward alcohol use. Attitudes toward alcohol use were measured with a three item-scale of which prior research (Stephenson, Hoyle, Palmgreen, & Slater, 2003) has demonstrated its validity and reliability: (a) People should not use alcohol, (b) The idea of using alcohol scares me, and (c) Using alcohol is okay. Answer categories ranged from (1) do not agree at all to (5) totally agree. Factor analysis (principal components; eigenvalue: 1.99, explained variance: 66.20%) yielded one factor with good internal reliability ($\alpha = .74$). Before computing the total attitudes score (sum of the items divided by the number of items), item 1 and item 2 were reversed. Higher scores on this measure are an indication of more positive attitudes toward drinking alcohol.

Descriptive norms on alcohol use. Similar to the previously shown valid and reliable measure used by Elek and colleagues (Elek et al., 2006), descriptive norms on alcohol use were assessed by asking respondents to estimate how many of their friends (a) drink alcohol, (b) drink more than 5 entities of alcohol on one occasion, and (c) get drunk while going out. Response categories were (1) none, (2) some, (3) a lot, (4) all of my friends. Principal components analysis showed that these items composed one factor with good internal consistency (eigenvalue: 2.20, explained variance: 73.25 , $\alpha = .82$).

Injunctive norms on alcohol use. In line with the previously shown valid and reliable measures used by Elek et al. (2006), six items measured respondents' injunctive norms. Respondents were asked to indicate whether they thought that it is okay for someone of their own age to (a) drink alcohol, (b) drink more than 5 entities on one occasion and, (c) get drunk while going out. In addition, they were asked to indicate whether they think their friends would find it okay if the respondent would: (a) drink alcohol, (b) drink more than 5 entities

on one occasion and, (c) get drunk while going out. Responses were given a 7-point scale ranging from (1) *definitely not okay* to (7) *definitely okay*. These six items were entered in a factor analysis (principal components; eigenvalue: 3.77, explained variance: 62.76), which indicated that all items compose one reliable factor ($\alpha = .88$).

Behavioral intentions to use alcohol. Following Ajzen's guidelines on measuring behavioral intentions (Ajzen, 1991), behavioral intentions were questioned by asking respondents how likely is it that they will in the next year: (a) drink alcohol, (b) drink more than 5 entities on one occasion, and (c) get drunk while going out. Responses ranged from (1) very unlikely to (7) very likely. These items composed one factor with good internal consistency (principal components; eigenvalue: 2.45, explained variance: 81.80, $\alpha = .89$).

Exposure to alcohol-related content on Facebook. Exposure to alcohol-related content on Facebook was questioned with 4 items. "How often do you encounter..." (a) photos on Facebook that show alcohol use, (b) status updates which refer to alcohol use, (c) photos on Facebook taken while going out, and (d) status updates which refer to going out. Responses ranged from (0) never to (6) almost every day. Factor analysis (principal components; eigenvalue: 2.84, explained variance: 70.98) indicated that these items composed one, reliable factor ($\alpha = .86$).

Control variables. Sensation seeking was assessed with the previously shown reliable and valid 8-item Brief Sensation-Seeking Scale (BSSS) (Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, 2002). A principal components analysis with oblique rotation indicated that all items, except one ("I would like to try bungee jumping"), loaded onto one factor (eigenvalue: 2.82, explained variance: 40.32). Therefore, a factor score was computed by adding the scores of the remaining seven items and dividing it by the number of items. These remaining seven items showed a good internal reliability ($\alpha = .74$). Gender was also assessed (0 = male, 1 = female).

Analyses

Descriptive statistics and correlation analyses were calculated. Conditional process analysis was used to test the mediation and moderation hypotheses. In particular, conditional process analysis was conducted in SPSS by means of Hayes' OLS regression based tool PROCESS (Hayes, 2013). PROCESS provides a convenient way to conduct conditional process analyses, and generates results that are similar to when these models would be estimated with SEM programs such as MPlus and LISREL (Hayes, 2013).

To test hypotheses 1 and 2, a moderated mediation model (Model 74) was estimated, which examined simultaneously (1) the processes through which exposure to alcohol-related content on Facebook and adolescents' intentions to use alcohol are related (mediation, hypothesis 1) and (2) the conditional nature of this relationship (moderation, hypothesis 2). Exposure to alcohol-related content on Facebook was entered as the predictor variable (X), respondents' intentions to use alcohol in the future as dependent construct (Y), descriptive norms, injunctive norms and attitudes as mediating variables operating in parallel (M) and gender and sensation seeking as statistical controls. In addition, the conditional indirect effect of X on Y through the different mediators was also examined. A graphical presentation of this conceptual diagram is given in Figure 1. As apparent from Figure 1, the present study thus examines a moderated mediation model in which X moderates its own indirect affect. Such models have been described in the literature as an example of moderated mediation, see Hayes (2013) and Preacher et al. (2007) for a discussion of moderated mediation models.

[FIGURE 1: ABOUT HERE]

Results

Descriptive Statistics

Table 1 displays the descriptive statistics of the main constructs in the study. Adolescents indicated to occasionally be confronted with alcohol-related content while using

Facebook ($M = 2.50$, $SD = 1.23$). In addition, they believed that some of their friends regularly consumed alcohol ($M = 2.30$, $SD = 0.67$) and that alcohol consumption was socially acceptable ($M = 4.17$, $SD = 1.44$). Adolescents themselves also showed on average a highly positive attitude toward alcohol use ($M = 4.04$, $SD = 0.76$) and indicated that it was likely that they would consume alcohol in the future ($M = 3.83$, $SD = 2.02$).

[TABLE 1: ABOUT HERE]

Correlation Analyses

Zero-order correlations between all variables of interest were calculated and are shown in Table 2. These correlations support significant relationships among alcohol-related content exposure on Facebook, attitudes toward alcohol use, descriptive and injunctive norms on alcohol use, and the intention to use alcohol in the future. Moreover, a partial correlation analysis controlling for gender and sensation seeking showed that exposure to alcohol-related content on Facebook and intentions to use alcohol in the future were significantly correlated, $r = .17$, $p < .01$.

[TABLE 2: ABOUT HERE]

Testing the Main Hypotheses

In order to test hypotheses 1 and 2 simultaneously, a conditional process model was estimated. As depicted in Figure 1, this moderated mediation model estimates simultaneously whether (1) descriptive norms (M1), injunctive norms (M2) and attitudes (M3) mediated the relationship between exposure to alcohol-related content on Facebook (X) and adolescents' intentions to drink alcohol in the future (Y); and (2) whether the relationships between these mediators (M1, M2, M3) and the outcome measure (Y) interact with exposure to alcohol-related content on Facebook.

[TABLE 3: ABOUT HERE]

Table 3 gives an overview of the results of this analysis. With regard to the first hypothesis, the data indicated that exposure to alcohol-related content on Facebook was a significant direct predictor of respondents' descriptive and injunctive norms with regard to alcohol use. No relationship was observed between Facebook use and attitudes toward alcohol use, and Facebook also did not directly predict respondents' intentions toward drinking of alcohol. Gender was a significant direct predictor of attitudes and injunctive norms. Sensation seeking predicted attitudes, descriptive norms, injunctive norms, and intentions directly. Attitudes, injunctive and descriptive norms appeared to be direct predictors of drinking intentions. In sum, the relationship between exposure to alcohol-related content on Facebook and alcohol intentions is mediated by adolescents' descriptive and injunctive norms, but not by adolescents' attitudes.

With regard to hypothesis 2, the results of the moderated mediation model indicated that the interaction effect between injunctive norms and exposure to alcohol-related content on Facebook significantly predicted adolescents' intentions to consume alcohol, while this was not the case for the interactions with descriptive norms and attitudes. The results indicated that the association between injunctive norms and drinking intentions was stronger for respondents who were confronted with alcohol use more often on Facebook. Yet, it has to be recognized that only a very small interaction effect was observed. For a value of 1.32 at the construct measuring alcohol exposure on Facebook, the conditional unstandardized indirect effect of injunctive norms on intentions to drink alcohol was .06 (bootstrapped confidence intervals $LLCI/ULCI = .02/.13$); for a value of 3.78 on Facebook alcohol exposure the observed effect was 0.09 (bootstrapped confidence intervals $LLCI/ULCI = .02/.17$).

This result was also confirmed by the index of moderated mediation and associated bias corrected bootstrap confidence intervals (Index = .01, $LLCI/ULCI = .00/.04$). This index of linear moderated mediation is a test "based on an interval estimate of the parameter of a

function linking the indirect effect to values of a moderator” (Hayes, 2015, p. 1). As outlined by Hayes (2015, p. 2), the significance of this test implies that “two conditional indirect effects estimated at different values of the moderator are significantly different from each other”. Thus, there is a small conditional effect of injunctive norms on intentions. When adolescents scored high on injunctive norms of alcohol use, users who indicated to be frequently exposed to alcohol-related content on Facebook intended to consume alcohol themselves in the future more strongly as compared to users who indicated to be less frequently exposed to alcohol-related content on Facebook. This interaction effect is displayed in Figure 2. Before this graph was drawn, variables were standardized into z-scores following the procedures outlined by Dawson (2013).

[FIGURE 2: ABOUT HERE]

Discussion

Over the last decade, scholars have found support for the hypothesis that exposure to alcohol use in traditional mass media relates to perceptions, attitudes, and behaviors regarding alcohol use (see, for instance, Beullens, Roe, & Van Den Bulck, 2012; Dal Cin et al., 2009). In contrast to this body of literature, the relationship between social media and alcohol-related outcomes has received far less attention. However, the specific attributes of social media, (i.e., the content is often produced by a user’s own peers and invite a user to comment on it), may be of particular relevance in relationship to alcohol use among adolescents. The present study addressed this relationship with a conditional process model that investigated different processes on how exposure to alcohol-related content on Facebook relates to adolescents’ intentions to use alcohol. Within this model, the results of this study support the mediation path of exposure to alcohol-related content on Facebook through social norms (H1), and the moderating path of exposure to alcohol-related content on Facebook with injunctive norms on alcohol use (H2).

First, in line with the differential susceptibility model, theory of reasoned action and the reinforcing spirals perspective, exposure to alcohol-related content on Facebook predicted adolescents' descriptive and injunctive norms on alcohol use. In turn, both of these social norms predicted adolescents' intention to use alcohol in the future. SNS appeared to be an ideal venue for adolescents to gain knowledge on their peers' perceptions of alcohol use. Alcohol is often referred to in SNS and is predominantly portrayed in a positive manner (Beullens & Schepers, 2013; Chou & Edge, 2012; Egan & Moreno, 2011). Nowadays, through the use of mobile platforms, such as smartphones and tablets, SNS can be accessed anywhere anytime. A decade ago, adolescents were particularly confronted with their peers' alcohol use through talking with them or through observing their drinking behavior during social activities. The current generation of adolescents is, however, through their use of SNS, provided continuous updates on their peers' perceptions, attitudes, and behaviors, including information on their alcohol use. The findings of the current study suggest that such updates on alcohol-related content on SNS reinforce positive norms on alcohol use, which seem to be associated with increased intentions to drink alcohol in the future.

Past research on the relationship between exposure to alcohol use in movies and adolescent drinking behavior has revealed similar pathways. For instance, Dal Cin et al. (2009) indicated that movie alcohol exposure predicted adolescents' alcohol use. This relationship was found to be mediated by alcohol-related norms, prototypes, expectancies, and friends' use. Together, prior research and the current study suggest that alcohol-related norms explain how messages on alcohol in both traditional mass media and social media predict adolescents' intentions to use alcohol. Research on traditional mass media and alcohol-related outcomes has also identified other explanatory mechanisms, such as positive beliefs associated with alcohol use, including relaxation and romance (Grube & Wallack, 1994).

Future research may explore whether these mediators also contribute to an explanatory model on the relationship between social media use and adolescents' intentions to use alcohol.

Moreover, this research may also explore why exposure to alcohol-related content on Facebook did not predict adolescents' attitudes toward alcohol use. One possible explanation for the lack of significant effects for the respondents' attitudes may be the fact that, overall, the respondents seemed to hold positive attitudes toward alcohol consumption. Holbert and Tchernev (2013), and Miller (2002) have argued that if particular actions are learned through the media and produce positive outcomes, the initial response shaping might be reinforced. Thus, transferred to the results of the current study, this might imply that respondents' existing positive attitudes toward the consumption of alcohol are being reinforced through their observations that their peers drink alcohol and approve this behavior. Longitudinal research is required to examine these assumptions.

Other research on traditional media and sexual risk behavior (Bleakley, Hennessy, Fishbein, & Jordan, 2011) also found that only normative perceptions were influenced by media use, but not the attitude toward the behavior. The study explained the non-significant result on the media-attitudes association by referring to the meta-messages that media content support. Media messages particularly showcase portrayals of individuals engaged in risk behavior. Therefore, the meta-message promoted in media content may principally refer to the belief that individuals frequently are involved in risk behavior. This might also be the case for SNS such as Facebook. Depictions of alcohol on SNS especially showcase pictures of peers engaged in drinking behavior but less explicitly emphasize drinking behavior in text references (Beullens & Schepers, 2013). Such text references may, however, particularly promote a positive attitude towards alcohol. An experiment is needed to further test whether depictions of peers drinking alcohol on SNS particularly stimulate social norms while positive text references may enhance a positive attitude toward alcohol use.

Second, in concordance with the differential susceptibility model and the reinforcing spirals model the present study showed that the relationship between injunctive norms and adolescents' intention to consume alcohol is contingent on exposure to alcohol-related content on Facebook. Although the effect was small, the findings showed that Facebook users with positive injunctive norms on alcohol use showed higher intentions to use alcohol when being more frequently exposed to alcohol-related messages on Facebook. Thus, they demonstrated stronger intentions to use alcohol in the future when believing their peers approved of alcohol use. In line with what has been argued by Rhodes et al. (2014), focus theory (Cialdini, Kallgren, & Reno, 1991; Cialdini, Reno, & Kallgren, 1990) might explain this effect. Focus theory argues that when norms are more salient in a given situation, they are more likely to result in norm congruent behavior. Recently, Rhodes et al. (2014) underlined the role of norm accessibility in predicting risk behavior (including alcohol use) among young adolescents. Their results provided support for the idea that the accessibility of mental constructs is an important mechanism through which the construct itself and behavior are related. For example, if pro-alcohol peer norms are highly accessible for an adolescent, this adolescent can easily bring to mind friends who would be supportive of him or her drinking. Consequently, this process may result in the drinking of alcohol. Applied to the current study, the principles of focus theory suggest that exposure to peers' pro-alcohol norms on Facebook renders pro-alcohol peer norms more accessible which, in turn, result in the intention to use alcohol.

Overall the results of the current study indicate that the relationship between exposure to alcohol-related content on SNS and drinking intentions is a complex one in which exposure to SNS has multiple roles. It is recommended that these relationships are explored further into detail in longitudinal research to shed light on how these trends evolve over time.

For instance, the present study showed that exposure to alcohol-related content on Facebook predicted descriptive and injunctive norms with regard to alcohol use. Over time,

the interaction effect between Facebook and norms might disappear as those frequently exposed adolescents might develop more favorable injunctive norms toward alcohol use.

Furthermore, it has to be noted that the observed moderation effect tested in hypothesis 2 was only confirmed for injunctive norms. Descriptive norms and attitudes did predict intentions, but no support for the existence of an interaction effect with alcohol-related Facebook use was found for the relationships between these constructs and behavioral intentions. One possible explanation for these findings is that peer injunctive norms are more salient on Facebook as compared to descriptive norms or attitudes. Potentially, alcohol-related posts on Facebook particularly emphasize their approval of alcohol while focusing less on frequency of alcohol consumption or positive outcomes.

Another explanation may refer to potential moderating variables regarding the trustworthiness of alcohol-related Facebook content. Some posts on Facebook may be considered to be less reliable because they aim for a positive self-representation of the user (Walther & Parks, 2002). Potentially, users may find Facebook-related posts on positive outcomes of alcohol use or frequency of alcohol use by peers less representative as they are carefully selected to maintain a positive self-presentation. They may have this critical receptive attitude less with regard to injunctive norms as they may think peers manage all of their alcohol-related posts (i.e., regarding positive consequences of alcohol use and frequency of alcohol use) according to their injunctive norm. However, further research is necessary in order to test the validity of these explanations.

This future research should preferably be longitudinal. The present study examined two potential paths of how exposure to alcohol use relates to behavioral intentions. However, following Slater's (2007) reinforcing spirals perspective and in line with the DSMM (Valkenburg & Peter, 2013b), a third hypothesis might be proposed. More specifically, one of the main propositions of both models is that there is a reciprocal relationship between media

use and cognitive or behavioral outcomes. Exposure to SNS on the one hand and attitudes and social norms on the other hand may mutually influence each other. For instance, exposure to media content positively portraying alcohol use might result in involvement with peers drinking alcohol, which in turn might foster the selection of media content with positive alcohol depictions (Slater & Hayes, 2010; Slater & Henry, 2013).

Unfortunately, because of the cross-sectional design of the current study, we cannot adequately test these dynamic relationships. Longitudinal research is required to draw conclusions about the temporal order of the studied relationships. As argued by Slater (2007), albeit promising, such research is also very challenging as the correct time lag must be used in order to be able to accurately model such dynamic relationships. The preliminary results of the current study, however, underline that such an approach would be helpful in fully unraveling the complex relationship between adolescents' social media use, alcohol use, and related mediators and moderators.

Apart from examining reciprocal relationships, future longitudinal research is encouraged to consider including the so-called "structural features" of social media content. Research on traditional media (Hanewinkel & Sargent, 2009; Vandenberg & Eggermont, 2011) has shown that these features are important predictors of the kind of content a user is exposed to during media use. Future research may consider studying structural features as predictors of exposure to alcohol-related content, such as the average number of likes an alcohol-related post receives on one's profile, as the number of likes increases the chance that a user is exposed to this message when checking news feeds on SNS.

As with all research studies, the present study has a number of shortcomings. First, the study relied on a convenience sample of adolescents. It is important to recognize that this might have affected our findings. In addition, the data were collected among a sample of Belgian adolescents. Past research has indicated that intercultural differences exist with regard

to the social acceptance of alcohol use, the use itself, and the display of alcohol use on SNS (Beullens & Schepers, 2013; Farhat et al., 2011; World Health Organization, 2014). The present study was conducted in Belgium, a country which is known to be rather tolerant in its alcohol policy, especially when compared to other countries such as the United States of America. As a result, the data of the present study do not allow us to generalize our findings to adolescents from other countries.

Furthermore, the effect sizes found in the current study were small, though, media literature indicates that this is not uncommon in media research and research from other related social sciences (Valkenburg & Peter, 2013a). Moreover, adolescents are in the middle of developing an identity. Over the years, the rather mild increases in their intentions to use alcohol may gain importance and become problematic from a long-term perspective. Prior research has in this view already suggested that relatively small increases in early and middle adolescents' intentions to use alcohol result in problematic drinking behavior later in life (e.g., Barnes, Welte, & Hoffman, 2002; D'Amico, Edelen, Miles, & Morral, 2008; Huang et al., 2012).

Furthermore, self-reported measures were used in the current study. The study can therefore not determine whether reported exposure to alcohol-related content on Facebook or self-reported intention reflect reality. Yet, the use of self-report measures in this type of research is not uncommon. Moreover, research has also indicated that self-report measures on alcohol use are quite reliable (Flisher, Evans, Muller, & Lombard, 2004).

Implications for Prevention

Despite its shortcomings, the present research has important implications from the perspective of prevention. It is important for prevention workers to be aware of the potential role SNS appears to play in the development of social norms with regard to alcohol use. Moreover, the present study indicates that these social norms develop already in young and

middle adolescence. Therefore, prevention efforts should be directed at adolescents in these age groups. Media literacy training might be helpful as several studies have indicated that (under certain conditions) increasing adolescents' critical thinking about media messages is a helpful strategy to decrease their intention to engage in risk behavior (Bergsma & Carney, 2008; Scull, Kupersmidt, Parker, Elmore, & Benson, 2010). These media literacy interventions might take multiple forms, but as underlined by Greene (2013), active involvement of the adolescents (e.g. through small group activities and discussions, encouraging perspective taking, and message design) seems to be a crucial factor in its effectiveness as it fosters greater mental efforts and comprehension compared to more passive strategies. So far, media literacy programs using SNS to reduce alcohol use among young individuals are still scarce. Yet, one intervention study (Ridout & Campbell, 2014) showed promising results. Ridout and Campbell (2014) constructed an intervention study in which they provided social norms feedback on university students' alcohol use. Participants in the intervention group received personalized messages via Facebook on the drinking norms of their peers and appeared to drink less after the intervention and to held more accurate drinking norms.

Conclusion

The present study adds to the research on media use and risk behavior by examining the different roles SNS have on adolescents' drinking behavior. Given that it has been shown that peer norms are an important predictor of adolescents' risk behavior, and that peer norms with regard to alcohol use are continuously accessible on SNS, the potential impact of SNS might be even more worrying than the impact of traditional media. Therefore, there is an urgent need for more research on the relationship between social media use and alcohol consumption, the processes mediating this relationship, and the conditions under which it occurs.

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Table 1

Descriptive statistics of main variables

	Range	Min	Max	<i>M</i>	<i>SD</i>
Exposure to alcohol-related content on Facebook	6	0.00	6.00	2.50	1.23
Attitudes towards alcohol use	4	1.00	5.00	4.04	0.76
Descriptive norms on alcohol use	4	0.67	4.67	2.30	0.67
Injunctive norms on alcohol use	6	1.00	7.00	4.17	1.44
Intentions to use alcohol	6	1.00	7.00	3.83	2.02
Sensation seeking	4	1.00	5.00	3.32	0.70

Table 2

Zero-order correlations

	1.	2.	3.	4.	5.	6.
1. Exposure to alcohol-related content on Facebook	1					
2. Attitudes toward alcohol use	.16**	1				
3. Descriptive norms on alcohol use	.30**	.30**	1			
4. Injunctive norms on alcohol use	.22**	.48**	.60**	1		
5. Intentions to use alcohol	.31**	.52**	.63**	.72**	1	
6. Sensation seeking	.34**	.28**	.38**	.36**	.49**	1

Note. ** Correlation is significant at the 0.01 level

Table 3

Conditional process model (moderated mediation) examining the conditional indirect effect of exposure to alcohol-related content on adolescents' intentions to consume alcohol

	Attitudes		Descriptive norms		Injunctive norms		Intentions	
	Coeff	LLCI/ULCI	Coeff	LLCI/ULCI	Coeff	LLCI/ULCI	Coeff	LLCI/ULC
								<i>I</i>
Constant	3.21*	2.89/3.53	1.15*	.88/1.42	2.08*	1.48/2.67	-3.98*	-5.44/-2.53
Facebook	.04	-.01/.10	.09*	.04/.13	.14*	.04/.24	-.19	-.70/.33
Sensation seeking	.26*	.17/.36	.31*	.23/.39	.63*	.45/.80	.52*	.35/.69
Gender	-.22*	-.36/-.09	-.10	-.21/.01	-.55*	-.79/-.31	.16	-.07/.38
Attitudes							.68*	.32/1.04
Descriptive norms							.84*	.42/1.27
Injunctive norms							.31*	.09/.52
Attitudes x Facebook							-.04	-.17/.09
Descrip. x Facebook							.01	-.16/.17
Injunct. X Facebook							.09*	.01/.16
Model summary	$R=.31, R^2=.10,$ $F(3,493)=17.37, p<.001$		$R=.42, R^2=.18,$ $F(3,493)=35.10, p<.001$		$R=.40, R^2=.16,$ $F(3,493)=31.76, p<.001$		$R=.81, R^2=.66,$ $F(9,487)=103.45, p<.001$	

Note: * $p<.05$

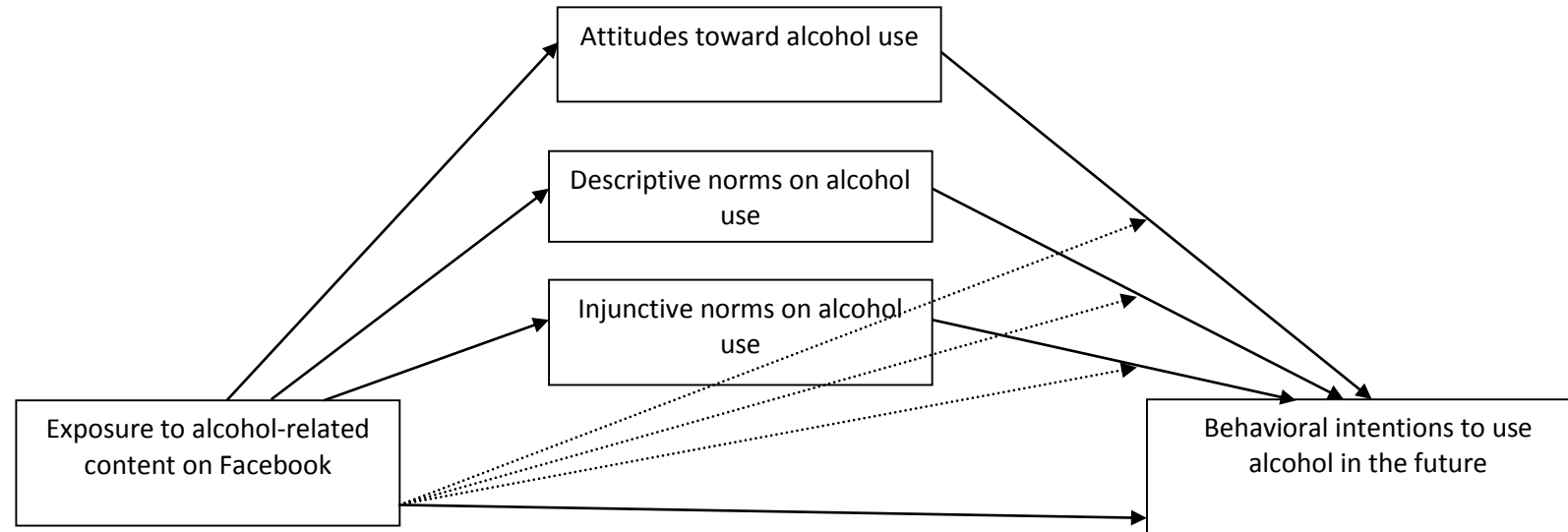


Figure 1. Conceptual diagram for the relationships between the exposure to alcohol use on Facebook, adolescents' attitudes and social norms on alcohol use, and behavioral intentions to use alcohol in the future. Full lines present predictive paths (hypothesis 1), dotted lines present moderated paths (hypothesis 2).

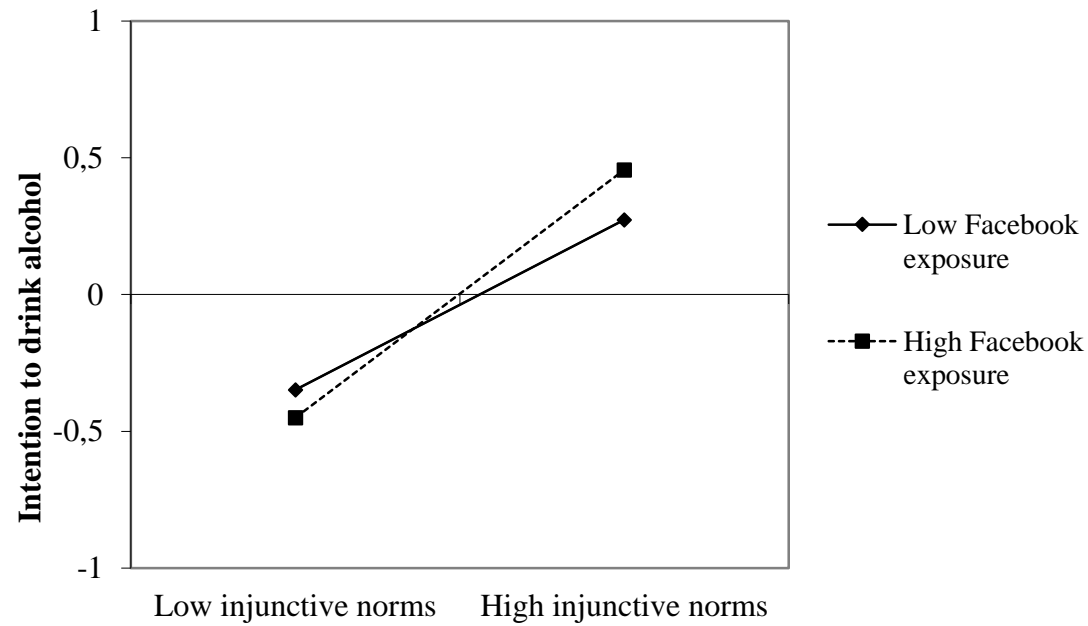


Figure 2. Visual representation of the conditional effect of adolescents' injunctive norms on their intention to consume alcohol (dependent variable) among adolescents with high versus low exposure to alcohol-related content on Facebook.